

MEMORANDUM THRU CEMVN-CD-LA, Project Engineer (J. Siffert)
 CEMVN-CD-LA, Area Engineer (T. Eilts)
 C/Const. Div.

FOR C/Engr Div (ATTN: CEMVN-ED-LC)

SUBJECT: Narrative Completion Report, Contract W912P8-06-C-0003, Coastal Wetlands Planning, Protection and Restoration Act (CWPPRA) South White Lake Shoreline Protection, Project Number: (ME-22) Vermilion Parish, Louisiana

1. SIGNIFICANT DATES/NUMBERS

Contract Award	17 October 2005
Preconstruction Conference	29 November 2005
Acknowledgment of Notice to Proceed	26 October 2005
Commencement Date	5 December 2005
Original Completion Date	25 September 2006
Revised Completion Date	28 October 2006
Date Completed	28 August 2006
Original Contract Amount	\$10,079,000.00
Contract Amount Earned	\$ 9,660,778.35
Liquidated Damages	\$0.00

2. SCOPE OF PROJECT

The work consisted of building a stone dike to elevation of +3.5' NAVD from dike centerline station 0+00, PI #1 to station 628+60, PI #98. The dike which was constructed of 650 lbs. stone, was located on the south side of White Lake, near Pecan Island, Louisiana.

On the lake side of the stone dike, a flotation cut was excavated to elevation -6.0' NAVD and averaged about 70 feet in width. This flotation cut was used for the partially loaded rock barges to reach the construction site.

On the back side of the rock dike, some of the flotation cut material was placed at elevation +4.0' NAVD and below, creating new marsh.

A demonstration reach was created from dike C/L station 153+85 to station 210+35, (5,650 feet). Weekly and monthly tests were conducted on the instrumentation installed during the course of the project.

3. PRIME CONTRACTOR/SUBCONTRACTORS:

Prime Contractor: Luhr Bros. Inc.
P. O. Box 50
Columbia, IL 62236

Responsible for the construction of a Stone Dike built to a grade of +3.5' NAVD. Construction of 6 demo areas, including placement of sand and extra geo-textile in demo areas A-1, A-2, B-1 and B-2, and installation of 14 settlement plates throughout the project and 72 plates in the demo areas.

Subcontractor: Weeks Marine, Inc.
304 Gaille Drive
Covington, LA. 70433

Responsible for the excavation of floatation cut for floatation for partial rock barges to reach work area; creating new marsh with floatation cut material. Installation of warning signs throughout the project at the Fish Dip Openings and near Pipelines. Upon completion of the work, backfilling the floatation cut with the extra material from the floatation cut and entrance cuts which could not be used for marsh creation. (Not enough area behind dike to place material for marsh creation)

Subcontractor: Eustis Engineering, Inc
3011 28th Street
Metairie, LA 70002

Responsible for the installment of 24 piezometers, 24 inclinometers with Sondex, and 48 additional inclinometers within the 6 demonstration areas. Also responsible for conducting weekly and monthly test with the instruments throughout the duration of the contract.

4. ITEMS OF WORK

ITEM #	DESCRIPTION	EST. QTY	UNIT PRICE	UNIT	ESTIMATED AMOUNT	AMOUNT EARNED
0001	Mobilization and Demobilization	1	LS	---	\$ 300,000.00	\$ 300,000.00
0002	Stone	258,000 241,329	Tons (Under-Run)	\$25.55	\$6,591,900.00 \$6,165,955.95 (16,671 Tons-Under-run)	\$6,165,955.95
0003	Geo-textile	207,000 210,953	Sq. Yds (Over-Run)	\$ 4.80	\$993,600.00 + \$18,974.40	\$1,012,574.40

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4. ITEMS OF WORK (continued)

0004	Floatation Dredging	1	LS	---	\$1,260,000.00	\$1,260,000.00
0005	Settlement Plates	13 +1 (One Extra Settlement Plate)	Each	\$1,600.00	\$20,800.00 + \$1,600.00	\$22,400.00
0006	Warning Signs	68	Each	\$1,800.00	\$122,400.00	\$122,400.00
0007	Instrumental	1	LS	---	\$700,000.00	\$700,000.00
0008	Granular Material (Sand)	4,300 3,688 Cys (Under-Run) (612 cubic Yards-Under-run)	CY	\$21.00	\$90,300.00 \$77,448.00	\$ 77,448.00
TOTAL PAID TO PRIME CONTRACTOR						\$9,660,778.35

5. EQUIPMENT USED ON THE PROJECT

PRIME CONTRACTOR: LUHR BROS. INC.

- 1 – 20’ Survey Skiff (LB-122) with 2 – 90 HP/OB
- 1 - 24’ Work Skiff (LB-117) with 225 HP/OB
- 1 - 20’ Work Skiff (LB-96) with 90 HP/OB
- 1 – 20’ Work Skiff (LB-55) with 90 HP/OB
- 1 – Work Barge (Spud Barge)(195’ x 35’) with 60’ mobile home used as an Office (L-1031)
- 1 – Work Barge (Spud Barge) (195’ x 35’) with 385 Cat. L. Armed Track Excavator (L-1035)
- 1 – Work Barge (Spud Barge) (195’ x 35’) with 385 Cat. L. Armed Track Excavator(L-1085)
- 1 – Geo-textile Work Barge (60’ x 20’)(Spud Barge)
- 1 – 385 Caterpillar Long Armed Excavator on Office Barge
- 1 – Landing Barge (with Spuds) (20’ x 40’)
- 2 - Tugs – (Shallow Draft) “ Jay Gene” & “ Mary B”.
- 1 – Tug “DOUGLAS”used to towing full barges to staging area from Mile 6, Vermillion R.

SUBCONTRACTOR: WEEKS MARINE INC.

- 1 – Bucket Dredge “WEEK’S 646” w/6 Cys Bucket
(175’ x 55’ Spud Barge) with 3500 Manitowac Dragline
- 1 Bucket Dredge “WEEKS 542” w/ 5 Cys Bucket
(150’ x 40’ Spud Barge) with 4900 Manitowac Dragline
- 1 - Crew Boat “Kristy”
- 1 – 20’ Work Skiff w/90 HP/OB
- 1 - Spud Barge with 98 Linkbelt with 20’ Driving Leads-- KS-100

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1- Shallow Draft Tug “Capt John” used for moving KS-100

1- 16’ Work Skiff w/50 HP OB

SUBCONTRACTOR: EUSTIS ENGINEERING, INC.

1 -20’ x 10’ Pontoon Boat w/50 HP/OB

1- Drill Barge (45’ x 18’ Shallow Draft) (Rented)

1 – 23’ Work Skiff w/150 OB

6. ROCK DIKE LAYOUT/ALIGNMENT/PI’s

The alignment of the dike had to be moved further into the lake because the PI’s were too close to existing shoreline. They are as follows:

PI #	DISTANCE TO BE MOVED MORE OUTWARD (NORTH)
46	MOVE PI, Move 30 Feet Outward
47	MOVE PI, Move 40 Feet Outward
51	MOVE PI, Move 20 Feet Outward
54A	ADD PI, Locating it 30 Feet Outward
54B	ADD PI, Locating it 25 Feet Outward
66A	ADD PI, Locating it 30 Feet Outward
70A	ADD PI, Locating it 30 Feet Outward
71A	ADD PI, Locating it 50 Feet Outward
75	MOVE PI, Move 50 Feet Outward
81	MOVE PI, Move 50 Feet Outward
82	MOVE PI, Move 50 Feet Outward
94	MOVE PI, Move 100 Feet Outward’
94A	ADD PI, Locating it 30 Feet Outward

Since the PI’s were moved this created new X & Y Co-ordinates and the stations changed because of the distances between the relocated PI’s. On the Drawings, PI #45 was the last one then they all changed. See List below:

OLD PI STATIONS

NEW ADJUSTED PI STATIONS

PI	X	Y	STATION	DIST		X	Y	STATION	DIST.
45	2908274.3	431880.4	281+54.63	-----		Same	Same	281+54.6	-----
46	2908447.9	432757.9	290+49.23	894.6		2908476.61	432765.74	290+62.8	908.1
47	2908196.9	433046.8	294+31.91	382.7		2908227.12	433072.30	294+58.0	395.3
48	2907891.4	433293.2	298+24.46	392.5		Same	Same	298+59.9	401.9
49	2906847.6	433531.7	308+95.19	1070.7		Same	Same	309+30.6	1070.7
50	2906629.9	433679.7	311+58.48	263.3		Same	Same	311+93.9	263.3
51	2906438.6	433982.3	315+16.51	358.0		2906451.38	434006.56	315+66.4	372.5
52	2906049.4	434045.6	319+10.86	394.3		Same	Same	319+70.25	403.9
53	2905005.7	433994.2	329+55.91	1045.1		Same	Same	330+15.35	1045.1
54	2904513.7	434092.9	334+57.68	501.8		Same	Same	335+17.2	501.8
54A						2904379.39	434174.83	336+74.5	157.3

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54B						2904139.59	434270.22	339+32.5	258.1
55	290375.7	43441.6	344+58.53	1000.9		Same	Same	345+21.9	589.4

OLD PI STATIONS

NEW PI STATIONS

PI #	X	Y	STATION	DIST.		X	Y	STATION	DIST.
56	2902577.2	434597.0	354+69.10	1010.6		Same	Same	355+32.5	1010.6
57	2902096.3	434765.2	359+78.59	509.5		Same	Same	360+42.0	509.5
58	2901188.2	435178.3	369+76.24	997.6		Same	Same	370+39.6	997.6
59	2900687.1	435312.5	374+95.05	581.8		Same	Same	375+58.4	518.8
60	2899446.7	436210.9	390+26.75	1531.7		Same	Same	390+90.1	1531.7
61	2898967.7	436418.0	395+48.64	521.9		Same	Same	396+12.0	521.9
62	2898516.8	436834.6	401+62.56	613.9		Same	Same	402+25.9	613.9
63	2898154.4	437719.8	411+19.12	956.6		Same	Same	411+82.5	956.6
64	2898207.3	438174.3	415+76.76	457.6		Same	Same	416+40.1	457.6
65	2897401.5	438462.3	424+32.49	855.7		Same	Same	424+95.8	855.7
66	2897346.1	439300.5	432+72.57	840.1		Same	Same	433+35.9	840.1
66A						2897174.0	439725.63	437+94.5	458.6
67	2896786.1	440398.4	445+05.17	1232.6		Same	Same	445+71.1	776.6
68	2896802.8	440920.2	450+27.23	522.1		Same	Same	450+93.2	522.1
69	2896745.3	436210.9	452+59.73	232.5		Corrected	Same	453+25.7	232.5
70	2896532.5	441361.5	455+63.00	303.3		Same	Same	456+29.0	303.3
70A						2896395.65	441970.27	462+53.0	624.0
71	2896268.3	442319.3	465+56.62	993.6		Same	Same	466+24.5	371.5
71A						2896201.88	442586.37	468+99.8	275.2
72	2895938.6	443045.2	473+53.98	797.4		Same	Same	474+28.8	528.9
73	2895927.3	443432.1	477+41.06	387.1		Same	Same	478+15.9	387.1
74	2895769.5	443626.5	479+91.49	250.4		Same	Same	480+66.3	250.4
75	2895302.0	443638.5	484+59.19	467.7		2895303.23	443688.44	485+36.6	470.4
76	2894293.9	443514.3	494+74.94	1015.8		Same	Same	495+60.9	1024.2
77	2894041.3	443578.1	497+35.48	260.5		Same	Same	498+21.4	260.5
78	2893619.9	443345.5	502+16.86	481.4		Same	Same	503+02.8	481.4
79	2893930.7	442603.8	510+21.03	804.2		Same	Same	511+07.0	804.2
80	2893896.4	442094.3	515+31.76	510.7		Same	Same	516+17.7	510.7
81	2893698.7	441444.6	522+10.91	679.2		2893666.60	441471.75	522+81.21	663.5
82	2892994.4	440549.6	533+49.82	1138.9		2892924.25	440580.38	534+41.28	1160.1
83	2892305.2	440219.8	541+13.91	764.1		Same	Same	541+57.66	716.4
84	2891590.9	440241.6	548+28.63	714.7		Same	Same	548+72.36	714.7
85	2890930.2	440403.3	555+08.82	680.2		Same	Same	555+52.56	680.2
86	2890083.3	440880.3	564+80.92	972.1		Same	Same	565+24.66	972.1
87	2889922.5	441373.4	569+99.61	518.7		Same	Same	570+43.36	518.7
88	2889789.9	442065.9	577+04.70	705.1		Same	Same	577+48.46	705.1
89	2890006.2	442583.5	582+65.69	561.0		Same	Same	583+09.46	561.0
90	2890780.6	443407.1	593+96.27	1130.6		Same	Same	594+40.06	1130.6

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OLD PI STATIONS					NEW-ADJUSTED PI STATIONS			
PI#	X	Y	STATION	DIST	X	Y	STATION	DIST
91	2890609.4	443686.2	597+23.75	327.5	Same	Same	597+67.56	327.5
92	2889806.5	443823.5	605+38.35	814.6	Same	Same	605+82.16	814.6
93	2889535.5	443815.9	608+09.43	271.1	Same	Same	608+53.26	271.1
94	2889292.9	443564.0	611+59.13	349.7	2889254.06	443656.13	611+76.87	323.6
94A					2889092.37	443789.70	613+86.62	209.8
95	2888792.9	443567.3	616+59.25	500.1	Same	Same	617+59.66	373.0
96	2888303.3	443958.8	622+86.13	626.9	Same	Same	623+86.56	626.9
97	2888027.4	444011.5	625+66.98	280.8	Same	Same	626+67.36	280.8
98	2887856.6	443923.7	627+59.08	192.1	Same	Same	628+59.46	192.1

7. ITEMS OF WORK/START/FINISH

Item 0001. Mobilization & Demobilization:

The subcontractor mobilized its equipment, Bucket Dredge “Weeks #646” on 27 December 2005 and started digging a flotation cut. On 4 February, the prime contractor mobilized its equipment and started the stone placement. The prime contractor was paid 60% once all of the equipment on the site. The remaining 40% was paid when all equipment was demobilized, which was on 29 August 2006, from the project. The prime contractor was paid \$300,000.00 under this item.

Item 0002. Stone: The prime contractor, Luhr Bros. Inc., was responsible for building a stone dike to a grade of +3.5’ NAVD with Slopes 1 vertical to 1.5 horizontal.

The prime contractor mobilized its equipment on 4 February 2006 and began stone placement on 5 February 06. Prior to placement of stone, geo-textile fabric was placed in the location of where the dike was to be built.

The contractor started on the upper limits around PI #1, Station 0+00 building dike to Station 20+00, #6. The pipelines located between PI #6 and #14, were skipped and would be completed at the end of the project.

The stone barges were brought to Mile 6, on the Vermillion River. The *M/V DOUGLAS* transported 2 barges at the staging area which was located at Schooner Bayou, located in the Old Intracoastal Waterway at the entrance of White Lake.

In the staging area, a 385 Caterpillar Long Reach Excavator on Spud Barge L-1085, was used to light-load full Barges. Full Barges were unloaded to about 50 to 44 %, and transferred to another barge. (Average depth in White Lake was from 5 to 6 feet) The two Tugs, “*JAY GENE*” and “*MARY B*” (light draft – 4.5 feet) were used to move the barges from the staging area to the work site.

At the work site, another 385 Caterpillar on work barge L-1035 was used to unload the partial barges. The stone dike was built to approximately 50 feet on both sides of existing pipelines.

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In Fish Dips, the dike was built to grade and stopped 25 feet from the centers of each Fish Dip. However, the stone was placed continuously through the Fish Dips at elevation -1.0' NAVD.

The prime contractor completed the stone placement on 10 July 2006. Approximately 241,329 Tons of 650 lb. stone was used on the project. This amounted to 153 loaded barges, which was brought from the prime contractor's quarry, Tower Rock Stone Co., in St. Genieve, Missouri.

The original contract amount was for 258,000 Tons of Stone. The prime contractor was paid for 241,329 Tons. The cost of the stone was \$ 25.55 per ton, which amounted to \$ 6,165,955.95. There was an under-run of 16,671 tons. This item under-run was 6.5%.

See ITEM #13 for more Information on the Stone Distribution.

Item 0003.Geo-Textile: The prime contractor started placement of geo-textile fabric on the same day as the stone placement, which was 5 February 2006. Prior to building the rock dike, the geo-textile fabric was placed using a lay barge. The fabric was stretched and stone was placed at intervals, every 25 feet prior to building the stone dike to grade of +3.5 NAVD. The fabric widths varied from 29' to 32', depending on the water elevations. The dike was built in the center of the fabric, as specified in the contract drawings.

The fabric came in lengths of 105'; however, the fabric was sewed together with 2 feet overlaps. In areas, like the Demo areas, where fabric could not be sewed; it was overlapped 10 feet. The demo area made it too small an area to work the fabric barge between the instruments. Geo-textile fabric was placed about 1000 feet ahead of the actual dike construction. The same unit, Caterpillar 385 long-reach excavator on work barge was used with the stone and fabric. In the Fish Dips, fabric was extended 5 feet beyond the stone dike (20' from center of the Fish Dip).

A total of approximately 210,953 square yards of geo-textile fabric was used on the project. The prime contractor was paid \$ 4.80 per square yard which amounted to \$ 1,012,574.40. The original contract quantity was 207,000 cubic yards. The geo-textile fabric over-ran the estimated quantity by 1%.

Item 0004. Floation Dredging: The subcontractor, Weeks Marine Inc., mobilized the bucket dredge "*Weeks 646*" on 27 December 2005. The bucket dredge started excavating the floatation cut in the demo area. The floatation cut was designed to be 90' maximum width at -6.0' NAVD, but was only excavated 75 feet wide as necessary. The floatation cut would provide floatation for the partially loaded rock barges to reach the work area for the construction of the rock dike.

Excavated material from the floatation cut was placed on the backside approximately 30 feet from center of the rock dike. The disposal material was placed at elevation +4.0. Any material from the floatation cut, not fitting behind the dike, was placed on the opposite site, (Lake Side) of the floatation cut, where it would be back filled into the floatation cut at the end of the project.

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On 10 January 2006, the subcontractor mobilized a second bucket dredge, “Weeks 542” and it also began excavating the floatation cut. On 12 February, the bucket dredge “Weeks’ 646” demobilized from the site, leaving only one dredge on the site.

On 14 March 2006, the Bucket Dredge “Weeks 646” returned to the project; however, the bucket dredge “Weeks 542” demobilized off the site, leaving only one bucket dredge to complete the floatation cut. The floatation cut was completed on 30 June 06. The bucket dredge demobilized off the site, the following day for repairs. It returned to the jobsite on 2 August, and began backfilling the entrance cuts and the floatation cut. The back filling was completed on 28 August 2006.

Approximately 60,284 linear feet of floatation cut was excavated and 12 entrance cuts averaging about 1000 feet in length were made. Dredged material placed on the back side of the newly constructed stone dike, totaled approximately 172 Acres of new march created.

Twelve entrance cuts were excavated to elevation -6.0’, by both bucket dredges used on the site. Upon completion of the rock dike, the Bucket Dredge “Weeks 646” began backfilling the floatation cut and the entrance cuts with the excess material placed in the lake. (See # 12 for Entrance Cut Locations)

Under this Item, the prime contractor was paid a lump sum of \$ 1,260,000.00.

Item 0005. Settlement Plates:

Under this Item, there were originally 13 settlement plates on the contract quantity. Another settlement plate was added in Bear Lake, # 11A. The prime contractor was paid \$ 1600.00 per settlement plate. 14 plates were used on the contract totaling \$22,400.00.

Settlement plates were installed on the jobsite at approximately every 5000 feet; except in Bear Lake, every 3000 feet. Prior to demobilizing off the site, final elevations were taken of each settlement plate by the contractor’s survey party on 15 July 2006. See settlement plate locations and final elevation on the following page.

Settlement Plate Locations and Final Readings....

REF #	DATE SET	DIKE C/L STATION	NEAR PI	X-Coordinate	Y Coordinate	SET ELV.	FINAL READING 7/15/06
SP-1	02/08/06	Sta. 00+04	#1	2930611.20	432910.83	+8.25	+8.00 NAVD
SP-2	02/21/06	Sta. 45+56	#14	2927269.65	430357.32	+8.30	+7.85 NAVD
SP-3	02/27/06	Sta. 80+06	#22	2925431.92	427595.96	+8.80	+8.30 NAVD
SP-4	02/13/06	Sta. 119+57	#32	2911907.29	427446.53	+8.40	+8.12 NAVD
SP-5	04/23/06	Sta. 227+85	#38	2911349.55	428130.82	+9.00	+8.84 NAVD
SP-6	03/08/06	Sta. 265+81	#42	2908377.41	430389.62	+9.20	+9.20 NAVD
SP-7	03/21/06	Sta. 294+06	#47	2908259.72	433032.24	+9.20	+8.25 NAVD
SP-8	04/01/06	Sta. 335+41	#54	2904492.97	434105.27	+9.15	+8.94 NAVD
SP-9	04/06/01	Sta. 374+44	#59	2900797.05	435282.54	+9.10	+8.86 NAVD
SP-10	04/27/06	Sta. 408+23	#63	2898290.49	437387.40	+8.65	+8.40 NAVD

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SP-11	05/07/06	Sta. 481+10	#74	2895726.08	443632.27	+9.05	+8.91 NAVD
SP-11A	05/26/06	Sta. 509+43	#79	2893867.32	442755.06	+9.15	+4.55 NAVD
SP-12	06/05/06	Sta. 546+57	#84	2891805.60	440236.20	+9.05	+7.85 NAVD
SP-13	06/26/06	Sta. 627+64	#98	2887941.45	443967.32	+9.45	+8.94 NAVD

Item 0006. Warning Signs:

A total of 68 warning signs were used on the project. The warning signs were placed at the entrance of each Fish Dip; on both sides of navigation gaps, and on the sides of each pipeline. The prime contractor was paid \$ 1800.00 per sign. This included a piling and the sign. The Class B- Treated pilings were driven to elevation +11.0' NAVD, top of piling. The 4 x 4 foot aluminum sign was installed approximately 6 inches from the top of the piling. The subcontractor, Weeks Marine, used a small work barge with a 98 Linkbelt using 20 ft. leads. The tug “*Capt John*” was used to mobilize the work barge at various locations. The total amount paid under this item was \$ 122,400.00.

Item 0007. Instrumentation: Under this item, another subcontractor was used. Eustis_Engineering was utilized. They were responsible for installation of 24 piezometers, 24 inclinometers with Sondex, and 48 inclinometers in the 6 demo areas, located from dike C/L Station 153+85 to Station 210+35. Once the instruments were activated, it was their responsibility to run tests weekly and monthly for the duration of the contract. As the work progressed the prime contractor was paid a percentage of this lump sum item. The subcontractor began work on the project on 19 February. The total amount paid under this Item was \$ 700,000.00. See DEMO AREAS, Item #8 for more info.

Item 0008. Granular Material (Sand): There were 4 Demo Areas requiring granular sand. Demo areas A-1, A-2, B-1 & B-2. Contractor was paid \$ 21.00 per cubic yard. Sand was paid by volumetric calculations. A total of 3,688 cubic yards Sand was used. This totaled to \$77,448.00. There was an under-run of about 8.6% under the estimated quantity. See DEMO AREAS # 8 for more details of the sand distribution.

8. DEMO AREAS

There were 6 demo areas on the jobsite. Each area was 900 feet in length which consisted of 4 Stations with 3 Inclinometers, one with a Sondex and a Piezometer. The following demo area reaches is as follows:

DEMO AREA A-1.

This area was from station 153+85 to station 162+85. Within these limits, there were 4 dike station locations. (Station 155+65 – Station 157+45 – Station 159+25 - Station 161+05) These locations were the areas where the instruments would be installed.

This demo area consisted of 1 layer of geo-textile fabric at existing ground level (+1.3) covered with a granular sand dune existing throughout the entire area. The sand dune was built to elevation +1.0, then covered with another layer of fabric, followed with 3 settlement plates,

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located parallel to the instruments on dike centerline and at each toe of the stone dike. The stone dike was built to elevation +3.5 NAVD, over the fabric.

Approximately 6,509 square yards of geo-textile was used. Approximately 2,469 tons of stone were used throughout this limit of work.. Approximately 897 cubic yards of granular sand was used to construct the sand dune.

Two instrument holes had to be re-drilled because the casings were damaged from the rough water in the lake during the early winter months. . The damaged instrument holes were filled with grout and re-drilled on the side of the damaged one. At Station 155+65, Inclinator I- A1-1-1N (North) and Station 157+45, Inclinator with Sondex I-A1-2-2C (Center) had to be replaced.

DEMO AREA C-1

This area was from station 163+35 to station 172+35. Within these limits, there were 4 locations for the instruments (Station 165+15 - Station 166+95 - Station 168+75, and Station 170+55).

This area consisted of building a stone dike with fabric from natural ground elevation (-1.2) throughout the demo area limits. This also included 3 settlement plates, one on center of the dike and one at each toe of the rock dike.

A total of 3,179 tons of stone and 3,254 square yards of geo-textile were used. No granular sand was used in this area.

Two additional holes with the damaged casing had to be re-drilled. The old holes were grouted and the new instruments were installed on the side of it. At station 165+15; an inclinometer with Sondex, was installed, I-C1-2-2C (Center). At station 170+55, an inclinometer with Sondex, I-C1-4-2C, was re-installed.

DEMO AREA B-1

This area was from station 173+85 to station 181+85. Within these limits, there were four stations with instruments. (Station 174+65 – Station 176+45 – Station 178+25 – Station 180+05).

This area consisted of a trench which was excavated throughout the work area limits. The trench was excavated by the prime contractor, prior to the installation of the instruments. In this area, the trench was lined with fabric, then filled with granular sand. Then another layer of fabric, the installation of settlement plates in 4 station locations, 12 plates, and the construction of the stone dike to elevation +3.5 NAVD was completed.

The total stone used in this area was 3,344 tons. Approximately 6,509 square yards of geo-textile fabric was also used. Also 953 cubic yards of granular sand was used, filling the trench to natural ground elevation.

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DEMO AREA B-2

This Demo area was constructed in the same manner as demo area B-1. This area was from station 182+35 to station 191+35. The four instrument station locations were at station 184+15, station 185+95, station 187+75, and station 189+55.

Approximately 3,289 tons of stone, 6509 square yards of geo-textile, and 934 cubic yards of granular sand was used in this demo area.

DEMO AREA C-2

This area was from station 191+85 to station 200+85. Within the limits of work, were the 4 instrument locations at station 193+65, station 195+45, station 197+25, and station 199+05. This demo area consisted of the same construction as in demo area C-1.

The total stone used was 3,426 tons and 3,254 square yards of geo-textile. There was no granular sand or extra layers of fabric in this area.

DEMO AREA A-2

This area was from station 201+35 to station 210+35. Within the Limits of Work, there was 4 instrument station locations (Station 203+15, Station 204+95, Station 206+75, and Station 208+55).

This demo area was identical to A-1, with a sand dune and an extra layer of fabric. The total stone used in this area was 2,450 tons. Total geo-textile used was 6,509 square yards. Approximately 904 cubic yards of granular sand was used to build the sand dune. Settlement plates were installed in locations as specified in the contract drawings. Each demo area was separated with 5 Fish Dips. (Fish Dip #6 thru #10).

9. PIPELINE CROSSINGS ON PROJECT

There were 10 pipelines located on the project. Listed below are locations and owners of the Lines. Three pipelines were not shown on drawing were found and marked. The three lines found belonged to Hilcorp..

REF. #	OWNER	SIZE STATUS	DIKE C/L STATION	NORTHING	EASTING	REMARKS
P1	Tennessee Gas Pipeline Co.	30" Active	N/A	443,735	2,887,489	Not Located on Project
P2	Tennessee Gas Pipeline Co.	30" Active	234+70	428,417	2,910,780	Located and marked
U1	Hilcorp	????	97+68	427,210	2,923,760	Located and marked
P3	Tennessee Gas	30" Active	STA. 72+16	428,040	2,926,090	Located and marked

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	Pipeline Co.					
P3A	Hilcorp	3' Inactive	STA.57+00	429,351	2,926,743	New Line Found-Plugged
P4	Hilcorp	3" Inactive	STA. 44+65	430,432	2,927,288	Located and marked
P5	Hilcorp	3" Inactive	STA. 28+60	431,768	2,928,065	No Hits by Magnometer
P5A	Hilcorp	3" Active	STA. 21+69	432,033	2,928,678	New Pipeline Found
P5B	Hilcorp	3' Active	STA. 21+24	432,037	2,928,734	New Pipeline Found
P6	Hilcorp	3' Active	20+84	432,074	2,928,776	Located and marked

10. FISH DIP LOCATIONS

There were 52 Fish Dip locations on the project. Each fish dip was installed about every 1000 feet. Fifty foot openings were left, with stone placed at elevation+1.0, with no fabric. See below for approximate locations:

REF. #	DIKE C/L STATION	X-Cordinate	Y-Cordinate	Between PI's
FD #1	Sta. 10+25	2929745.09	432470.66	# 4 & #5
FD #2	Sta. 116+25	2922225.65	427352.32	#31 & #32
FD #3	Sta. 131+25	2920821.86	427223.42	#33 & #34
FD #4	Sta. 145+25	2919441.28	426991.08	#33 & #34
FD #5	Sta. 153+60	2918616.94	426863.84	#34 & #35
FD #6	Sta. 163+10	2917667.31	426851.34	#35 & #36
FD #7	Sta. 172+60	2916723.75	426961.84	#35 & #36
FD #8	Sta. 182+10	2915780.20	427072.33	#35 & #36
FD #9	Sta. 191+60	2914836.65	427182.83	#35 & #36
FD #10	Sta. 201+10	2913901.82	427340.90	#36 & #37
FD #11	Sta. 210+60	2912979.04	427566.68	#36 & #37
FD #12	Sta. 221+00	2911994.94	427900.56	#37 & #38
FD #13	Sta. 230+00	2911147.27	428202.99	#37 & #38
FD #14	Sta. 251+50	2909311.31	429306.53	#40 & #41
FD #15	Sta. 264+50	2908462.30	430289.99	#41 & #42
FD #16	Sta. 273+75	2908133.14	431131.88	#43 & #44
FD #17	Sta. 282+25	2908289.98	431949.00	#45 & #46
FD #18	Sta. 293+25	2908311.10	432969.10	#46 & #47
FD #19	Sta. 302+75	2907486.73	433385.66	#48 & #49
FD #20	Sta. 314+00	2906531.11	433860.58	#50 & #51
FD #21	Sta. 322+25	2905794.96	434033.07	#52 & #53
FD #22	Sta. 332+25	2904800.15	434035.44	#53 & #54
FD #23	Sta. 342+25	2903859.73	434355.28	#54B & #55

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FD #24	Sta. 352+00	2902905.66	434545.88	#55 & #56
FD #25	Sta. 361+00	2902043.51	434789.22	#57 & #58
FD #26	Sta. 369+00	2901315.32	435120.48	#57 & #58
FD #27	Sta. 381+00	2900248.47	435630.20	#59 & #60
FD #28	Sta. 389+00	2899600.56	436099.46	#59 & #60
FD #29	Sta. 398 +00	2898829.62	436545.58	#61 & #62
FD #30	Sta. 409+00	2898261.40	437458.44	#62 & #63
FD-31	Sta. 419+50	2897915.48	438278.60	#64 & #65
FD-32	Sta. 427+00	2897386.38	436691.00	#65 & #66
FD-33	Sta. 435+50	2897265.76	439498.96	#66 & #66A
FD-34	Sta. 446+75	2896789.42	440502.25	#67 & #68
FD-35	Sta. 457+25	2896511.44	441455.16	#70 & #70A
FD-36	Sta. 468+00	2896225.94	442489.61	#71 & #71A
FD-37	Sta. 475+00	2895936.52	443116.37	#72 & #73
FD-38	Sta. 487+25	2895117.57	443656.41	#75 & #76
FD-39	Sta. 494+75	2894378.49	443528.89	#75 & #76
FD-40	Sta. 504+00	2893657.47	443255.85	#78 & #79
FD-41	Sta. 514+00	2893911.02	442311.46	#79 & #80
FD-42	Sta. 522+00	2893694.75	441548.03	#80 & #81
FD-43	Sta. 533+20	2893001.83	440673.53	#81 & #82
FD-44	Sta. 543+30	2892132.94	440225.06	#83 & #84
FD-45	Sta. 554+30	2891049.25	440374.16	#84 & #85
FD-46	Sta. 564+30	2890077.91	440611.89	#85 & #86
FD-47	Sta. 574+25	2889850.72	441748.23	#87 & #88
FD-48	Sta. 582+25	2889973.64	442505.59	#88 & #89
FD-49	Sta. 591+30	2890568.28	443181.29	#89 & #90
FD-50	Sta. 602+30	2890153.58	443764.15	#91 & #92
FD-51	Sta. 612+30	2889213.09	443689.97	#94 & #94A
FD-52	Sta. 620+30	2888581.76	443736.14	#95 & #96

11. SURVEYS

Surveys were taken using GPS. Co-ordinate points were taken from the contract drawings. Prior to the excavation of the flotation cut and the construction of the rock dike, some PI's had to be relocated more towards the Lake.

Cross-sections of the rock dike and flotation cut were taken at 200 foot intervals. Profiles of the constructed rock dike were taken every 20 feet.

Two bench marks were used on the project. For the upper reach from PI #1 to PI #60, the monument ME- 16-SM-10 was used. For the lower reach, PI #61 to PI #98, the monument, ME -16-SM-12 was also used.

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Surveys of the disposal area and the floatation cut including the rock dike were taken as the job progress. Surveys of the demo areas were taken on weekly and monthly basis.

12. ENTRANCE CUTS

Entrance Cuts were excavated by the subcontractor, Weeks Marine, in order to reach the work area. The entrance cuts provided access for the rock barges and bucket dredges to reach the work area. Listed below are entrance cut locations with x and y Co-ordinates (See As-Built Drawings).

ENTRANCE REF.# APPROX. STATION	NEAREST PT NEAR FLOAT. CUT	MID POINT	FURTHEREST POINT OUT INTO LAKE	NEAREST PI LOCATION
#1 STA. 198+00	X= 2914234.20 Y=427403.93	X=2914320.33 Y=427753.48	X=2914445.40 Y=428261.00	# 36
#2 STA. 13+50	X=2929391.73 Y=432512.50	X=2929291.80 Y=432868.35	X=2929138.83 Y=433387.68	# 5
#3 STA. 122+60	X=2921548.61 Y=427653.77	X=2921373.26 Y=427968.18	X=2924413.12 Y=427516.26	# 32
#4 STA. 266+00	X=2908400.35 Y=430470.10	X=2908835.23 Y=430660.32	X=2902980.11 Y=430810.55	# 42
#5 STA. 57+50	X=2924595.85 Y=427660.37	X=2924502.95 Y=427590.89	X=2924413.12 Y=427516.26	# 16
#6 STA. 85+00	X=2924963.15 Y=427660.45	X=2924915.10 Y=427827.00	X=2924680.33 Y=427940.48	# 22
#7 STA. 316+00	X=2906563.36 Y=434515.99	X=2906487.85 Y=434327.02	X=2906412.35 Y=434138.04	# 51
#8 STA. 416+00	X=2898261.08 Y=438288.80	X=2898530.66 Y=438420.08	X=2898870.40 Y=438730.52	# 64
#9 STA. 498+00	X=2890921.26 Y=443459.92	X=2891238.99 Y=443792.55	X=2891653.42 Y=444226.44	# 77
#10 STA. 36+50	X=2927340.77 Y=431250.30	X=2927133.09 Y=431540.68	X=2926950.15 Y=431855.08	# 12
#11 STA. 31+00	X=2927755.63 Y=431790.32	X=2927526.22 Y=432050.32	X=2925260.03 Y=432350.56	# 11

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#12	X=2928351.42	X=2928040.08	X=2927821.68	# 8
STA. 24+00	Y=432150.50	Y=432506.82	Y=432750.66	

13. STONE DISTRIBUTION

153 Loaded Barges were used on the project. Listed below is the distribution of the barges of 650 pound stone used on the project.

STATION TO STATION	BETWEEN PI'S	DIST.	TONNAGE USED	TONS PR/FT	REMARKS
STA. 0+00 to 20+00	# 1 & # 6	2,000'	8,249	4.12	Upper Limits-East
STA. 22+66 to 28+13	# 7 & # 9	547'	2,637	4.82	Up to Pipeline
STA. 29+13 to 34+16	# 10 & # 12	503'	2,455	4.80	Up to P/L
STA. 35+24 to 43+78	# 12 & # 13	854'	3,694	4.32	Up to Pipelune
STA. 45+18 to 56+69	# 14 & # 16	1,151'	4,878	4.24	To Navigation Gap
STA. 61+65 to 71+70	# 17 & # 19	1,005'	4,286	4.26	To P/L
STA. 72+84 to 83+10	# 20 & # 22	1,026'	4,705	4.59	To Loading Docks
STA. 88+58 to 96+83	# 23 & # 26	825'	3,269	3.96	To Pipeline
STA. 98+15 to 103+82	# 27 & # 28	577'	2,360	4.16	Up to Small Bayou
STA. 104+97 to 153+85	# 29 & # 34	4,888'	20,233	4.14	Up to Fish Dip #5
STA. 153+85 to 210+35	# 34 & # 37	5,650'	18,157	3.21	Demo Area
STA. 210+35 to 234+25	# 37 & # 38	2,390'	8,801	3.68	Up to Tenn. Gas PL
STA. 235+50 to 266+71	# 38 & # 42	3,121'	10,983	3.52	West of Tenn. PL
STA. 266+71 to 309+30	# 42 & # 49	4,259'	13,945	3.27	Up to Fish Dip #20
STA. 309+30 to 375+58	# 49 & # 59	6,628'	22,771	3.44	Near Fish Dip #31
STA. 375+58 to 416+40	# 59 & # 64	4,082'	14,305	3.50	Up to Fish Dip #34
STA. 416+40 to 456+29	# 64 & # 70	3,989'	15,358	3.85	Near Fish Dip #36
STA. 456+29 to 498+21	# 70 & # 77	4,192'	18,440	4.40	Near Fish Dip #39
STA. 498+21 to 534+41	#77 & # 82	3,620'	26,932	7.44	Bear Lake East
STA. 534+41 to 555+52	# 82 & # 85	2,111'	9,937	4.71	Bear Lake. East
STA. 555+52 to 594+40	# 85 & # 90	3,888'	13,918	3.58	Bear Lake West
STA. 594+40 to 628+60	# 90 & # 98	3,420'	11,016	3.22	Lower Limits-West
TOTAL		60,716	241,329	3.98	

13. TIME EXTENSIONS

The original contract was for 330 days. Due to Hurricanes KATRINA and RITA, the contract was extended 34 days. Three days were lost due to unsuitable weather during the work. The total number of days for the contract was 367 days. The work was completed in 307 days.

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14. PROBLEMS ENCOUNTERED

One of the biggest problems was the discovery of 3 additional unmarked pipelines on the Upper Limits of Work in the Reach between PI #6 and PI #14). Two lines were discovered by a survey party marking the pipelines that were shown on the drawings. A pipeline was hit by the Bucket Dredge excavating the flotation cut near PI #16. This could have been a major problem if the lines were undetected prior to excavating the floatation channel.

Another problem was weather. During the winter months in February and March, the drill crew installing the instruments in the demo area was hindered by rough water from the northerly blows. Four instrument locations were damage and had to be re-drilled.

15. QUALITY CONTROL/QUALITY ASSURANCE

Quality Control Representatives on the project was Mr. Mariano Inserra and Mr. William Azelle, for the prime contractor. The alternates were Mr. Daryl Curry and Mr. Mike Thompson for Weeks Marine. The project superintendent for the prime contractor was Mr. Danny Moore.

Prior to commencing work, a Mutual Understanding meeting was conducted in regards to the prime contractor's responsibilities and the Corps responsibilities on the contract.

The Three Phase Inspection was conducted throughout the duration of the project. A Preparatory meeting was conducted prior to each phase of work and followed by Initial Inspections once the work started. Follow-up inspections were conducted daily as work progressed.

Representing the Corp was Al Mistrot, Project Inspector, Mr. James Siffert, Project Engineer; and Mr. Ted Eilts, Area Engineer, from Lafayette Area Office.

16. MODIFICATIONS/CLAIMS

The only modifications on the contract were funding mods and time extension mods. There were no claims on the project.

17. ENVIRONMENTAL QUALITY CONTROL

The contractor's concern towards Environmental Quality Control was Outstanding. The site Inspector and the contractor made daily environmental inspections of the entire work site where the work was being performed.

18. SAFETY

The contractors' attitude towards safety was outstanding. A total of approximately 29,290 Accident Free Man hours were used to perform the work. Contractors held weekly safety meetings, daily inspections, and drills in a timely manner. The project lasted 307 days with no lost time injuries.

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18. FINAL ACCEPTANCE

A Final Inspection of the project was performed on 28 August by DNR and COE personnel. All work on the contract was completed in accordance with the plans and specifications. All equipment was demobilized off the jobsite on 29 August 2006.

AL MISTROT
Project Inspector, LAO

CF:
CEMVN-CD-C
CEMVN-CD-CV (Shepherd)
CEMVN-ED-LC
CEMVN-CD-QM
CEMVN-CT
CEMVN-PA
CEMVN-OD-C
CEMVN-OD-T
CEMVN-CD-G
Siffert
Mistrot
CEMVN-CD-LA File
DNR (Juneau)